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Editorial

The June 2024 (Vol. 32, No. 2) issue of *CIT. Journal of Computing and Information Technology* brings four papers from the areas of natural language processing, image processing, network security, and biomedical image classification.

The first paper in this issue, titled *E-Commerce Fake Reviews Detection Using LSTM with Word2Vec Embedding*, deals with a natural language processing topic. The authors of the paper, Mafas Raheem and Yi Chien Chong address the detection of fake reviews in e-commerce, a critical issue impacting customer perceptions. Using various deep learning models and word embeddings, the study evaluates their performance in identifying fake reviews. The methods tested include simple LSTM, 1D convolutional neural network (CNN), and a combined CNN+LSTM, all of which are trained on different word embeddings like Word2Vec, GloVe, FastText, and Keras embeddings. Additionally, the study also considers transfer learning-based models using BERT and DistilBERT transformers. The methods are evaluated on a subset of Yelp Reviews dataset consisting of 10,000 instances of review data and spanning across 10 distinct categories. The simple LSTM model with Word2Vec embeddings achieved 91% accuracy and an F1-score of 0.9024, outperforming other non-transformer models. DistilBERT achieved the best results overall with 96% accuracy and a 0.9639 F1-score. The study demonstrates the importance of strategies like early stopping and regularization to improve model generalization.

In the paper, titled *A Crack Detection Method for Civil Engineering Bridges Based on Feature Extraction and Parametric Modeling of Point Cloud Data*, the authors Yinlong Li, Maoyao Li, and Hui Tang deal with an image processing topic – automated crack analysis in concrete bridges. The paper introduces a novel method based on point cloud data (PCD). The method combines PCD feature extraction techniques, such as outlier removal, denoising, and 3D coordinate transformation, with a hierarchical neural network enhanced by Rodriguez rotation. This integrated method allows for capturing both local and global crack patterns, including crack orientation. Experimental results on a dataset containing about 5,000 crack images and 1024x768 pixels resolution show high performance, with 92.83% feature extraction accuracy, 95.73% parameter analysis accuracy, and a 0.91 F1-score of the crack analysis model. The method appears to be more efficient than existing techniques, highlighting its potential for accurate and automated crack detection in bridges.

Improving cybersecurity via network intrusion detection systems (NIDS) is highly important in contemporary networks. NIDS include monitoring network traffic, analyzing communication characteristics, status and anomalies, and issuing alerts or taking measures when a network attack is detected. In the paper titled *Network Intrusion Detection Based on Convolutional Recurrent Neural Network, Random Forest, and Federated Learning*, the authors Qianying Zou, Yushi Li, Xinyue Jiang, Yuepeng Zan, and Fengyu Liu focus on a novel NIDS framework that includes a combination of machine learning methods – a convolutional recurrent neural network (CRNN) and random forest (RF), under a federated learning setup. The proposed approach addresses the issues of data privacy, computational efficiency, and model generalization in traditional methods. By combining CRNN's ability to extract spatial features, RF's noise reduction and feature selection, and federated learning's ability for collaborative model training while maintaining privacy, the framework improves detection accuracy and robustness. Extensive experiments show that the method outperforms current techniques in key performance metrics in several attack scenarios, making it a promising solution for real-world cybersecurity applications.

In the last paper of the issue, titled *SSResNeXt: A Novel Deep Learning Architecture for Multi-class Breast Cancer Pathological Image Classification*, the authors Bo Xu, Faming Li, and Ying Wu deal with the topic of biomedical image classification. The study presents SSResNeXt, a novel deep learning architecture for the multi-class classification of breast cancer pathological images, incorporating asymmetric convolutions and channel attention mechanisms in a new Small-SE-ResNeXt block. Evaluated on the BreaKHis dataset comprising 7,909 images classified into 8 categories, SSResNeXt achieves state-of-the-art accuracy across multiple magnification scales (40X, 100X, 200X, and 400X), outperforming existing models like ResNet and Swin transformer variants. The architecture improves feature extraction without significantly increasing model complexity, making it a promising tool for computer-aided diagnosis systems in clinical environments. Still, the authors conclude that the model needs additional validation on more diverse datasets.

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